'Crystal Ball' Technology Helps Model Forest Stakeholders Envision the Future

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[Photo: Researcher examines a tree damaged by spruce weevils.]

'Crystal ball' technology developed in Canada may one day let local stakeholders around the world predict the future of their forests.

Computer models developed by the McGregor Model Forest Association (MMFA) are now being used to forecast the effects of different forest management scenarios on a commercially harvested forest near Prince George, British Columbia (B.C.). Tapping databases that store information on everything from soil types to tree species, the models generate mapped representations — and in some cases, three-dimensional (3D) images — of how the mountainous region would look under various land-use management strategies.

This work, conducted under a program endorsed by the Canadian Forest Service, the Canadian International Development Agency, the Canadian Department of Foreign Affairs and International Trade, and the International Development Research Centre (IDRC), is based on the input of numerous groups that have direct interests in what happens to the McGregor forest.

McGregor Model Forest

Spruce, fir, and pine trees in the Prince George area of B.C. have been logged since the 1920s. Today, the forest products company, Northwood Inc., harvests trees there in a 181,000-hectare tract, under a renewable 20-year tenure agreement with the provincial government. In 1993, this area was designated the McGregor Model Forest by the Canadian Model Forest Program, which had been launched a year earlier to find ways of improving the science of forest management.

The managing partners of the MMFA include Northwood, the B.C. Ministry of the Environment, the B.C. Ministry of Forests, and the Canadian Department of Fisheries and Oceans. Some 30 local groups are also members of the not-for-profit organization. Their interests range from recreation (such as hiking and backcountry skiing) to protecting the biodiversity of the region. "The

stakeholders realized that changes in traditional methods of planning, harvesting, and regeneration were needed in order to eventually return the landscape to something like its original condition," says Glenn Singleton. (Singleton is the MMFA Communications Coordinator, and one of the staff developing the computerized technology.)

Sustainable forest management

The technology is used to help MMFA members cooperatively decide where to focus their efforts to achieve their common goal of sustainable forest management, adds Singleton.

For example, the Future Landscape Interpreter (FLI) generates 3D images of how the forest would look depending on such variables as when and where trees are harvested, and whether clear-cutting or partial-cutting is employed. "We've tried to show how the landscape might appear in a way people can relate to, because they sometimes have a hard time understanding the potential effects of different management (choices) by simply looking at a map," says Singleton.

Virtual reality

"The FLI lets them look at computer-rendered images that include mountains, valleys, and rivers, showing forest changes and evolving harvest patterns," he explains. In addition, the MMFA is using the virtual reality modeling language (VRML) to access FLI images in sequence, thereby allowing viewers to 'move' around the pictured landscape at their discretion.

FLI and VRML are just two components in a whole suite of computerized tools — ranging from geographic information systems (GIS) to strategic planning models — used at McGregor. While some of those tools require specialized equipment to handle and display the data, not all do. Consequently, the MMFA has been able to share the results of its work with forestry personnel across Canada and in other countries, through two model forest networks.

IMFN

The Canadian Model Forest Network includes 11 model forests across the country. An expansion of the Canadian program, the International Model Forest Network (IMFN), currently links model forests in six countries including Canada, the United States, Mexico, Russia, Chile, and Japan. The IMFN is coordinated by the International Model Forest Network Secretariat, which is housed at IDRC.

"The IMFN [is helping] to build and broaden the understanding and practice of sustainable forest management on a global scale, and we are pleased to be involved in their efforts," stresses Jim Burbee, the MMFA President.

Gassinski Model Forest

Through the IMFN, the McGregor was twinned in 1994 with the Gassinski Model Forest in Russia's far eastern Khabarovsk Krai region. The MMFA worked with the Russians to establish the model forest program at Gassinski, which has a climate and ecology similar to McGregor. Over the next four years, the Canadians also helped their Russian counterparts install and utilize a GIS-based system, and construct a building to serve as the Gassinski forest's technical centre.

Although the twinning officially ended in 1998, some exchanges continue. A group from Russia's far east recently visited the Prince George area to learn value-added wood processing techniques. In addition, cultural and possible business ties are being forged between the indigenous Nanai people of the Gassinski area and the Lheidli T'enneh First Nation people who live near the McGregor forest.

New perspectives

Involvement with the Gassinski Model Forest has provided the Canadians with new perspectives, notes Singleton. "For example, at Gassinski there is interest in harvesting non-timber forest products such as nuts, oils, and mushrooms. We now recognize that similar opportunities exist in Canada, and could be considered for the future."

Meanwhile, the MMFA's technology and operational programs are attracting interest from other forest companies and governments. This opportunity, combined with its need to achieve greater self-sufficiency, led the MMFA to establish a subsidiary company called the McGregor Resource Analysis Group. "Our technologies have been validated through our work with Northwood and others," says Singleton. "This company helps the MMFA offer its capabilities further, while maintaining our focus on the research and development of sustainable forest management."

Curt LaBond is an Ottawa-based freelance writer. (Photo: courtesy of G. Singleton)

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